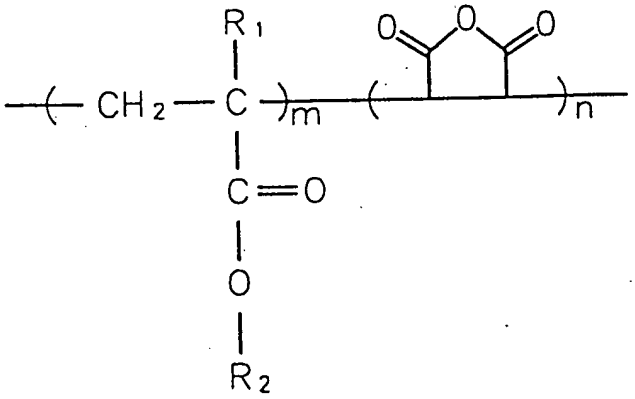

wherein R_1 is a hydrogen atom or methyl, R_2 is an acid-labile tertiary alkyl group, m/(m+n) is 0.5 to 0.8, and m+n = 1, and wherein R_2 is 2-methyl-2-norbornyl, 2-ethyl-2-norbornyl, 2-methyl-2-isobornyl, 2-ethyl-2-isobornyl, 8-methyl-8-tricyclo[5.2.1.$0^{2,6}$]decanyl, or 8-ethyl-8-tricyclo[5.2.1.$0^{2,6}$]decanyl; and

(b) a photoacid generator (PAG).

REMARKS

Summary

By this Amendment, Claims 1 and 5 have been revised, and Claims 3 and 7 have been canceled. Accordingly, Claims 1-2, 5-6 and 9-18 are now pending in the application.

Claim Objections

By this Amendment, Claims 3 and 7 have been canceled, thus overcoming the Examiner's objection under 37 C.F.R. ¶1.75(c).

35 U.S.C. ¶102 and ¶103 – Asakawa et al.

Claims 1-3, 5-7 and 9-14 were rejected under 35 U.S.C. ¶102 or ¶103 as being unpatentable over Kinsho et al. (US 6312867), taken alone or in combination with Hosaka et al. (US 5405720), for the reasons stated at pages 2-7 of the Office Action. However, Applicants respectfully contend that the now-pending Claims 1-3, 5-6 and 9-14 define over the cited references, and in view of the following representations, reconsideration of the rejections under 35 U.S.C. ¶102 and ¶103 is requested.

The polymers 37 and 39 of Kinsho et al. have monomeric ratios of d=0.40. d2=0.30 and e=0.30, and in particular, the monomeric ratio of the polymerization unit of acrylate is 0.40. In contrast, according to the now-claimed invention, the monomeric ratio of the polymerization unit of acrylate having an acid labile bulky alkyl group is 0.5 to 0.8. As explained below, in the present invention, the monomeric ratio of a polymerization unit of acrylate having an acid labile bulky alkyl group is an important factor achieving favorable photosensistive characteristics, such as contrast and dry etch resistance. The present invention exhibits a relatively high monomeric ratio of the polymerization unit of acrylate since the polymer of the invention is formed as copolymer of a polymerization unit of acrylate and a polymerization unit of maleic anhydride. Also, the polymerization unit of acrylate has a group which enhances contrast and dry etch resistance simultaneously.

The polymer of Kinsho patent comprises a polymerization unit of acrylate having a bulky alkyl group as an acid labile group, a polymerization unit of norbornene having a tertiary butyl group as an acid labile group, and a polymerization unit of maleic anhydride. Thus, particularly in view of the presence of three polymerization units, one of ordinary skill would not be motivated to increase the monomeric ratio of a polymerization unit of acrylate having acid labile bulky alkyl group.

Generally, because maleic anhydride cannot be homopolymerized by free radical polymerization, maleic anhydride is polymerized by alternating copolymerization with comonomers such as norbornene or vinyl ether. Thus, conventional polymers containing maleic anhydride have three or more different monomer units.

The present invention is directed to a random copolymer of maleic anhydride and (meth)acrylate derivative having acid labile group, which exhibits a more simple structure and better characteristics than the terpolymer or tetrapolymer of the conventional art. Also, the polymer of the present invention may be formed by free radical polymerization, which is quite different from the alternating copolymer of maleic anhydride.

For at least the reasons stated above, Applicants respectfully contend that Claims 1-2, 5-6 and 9-18 are neither anticipated by, nor obvious in view of, the teachings of the cited references, taken individually or in combination.

Conclusion

No other issues remaining, reconsideration and favorable action upon the Claims 1-2, 5-6 and 9-18 now-pending in the application are requested.

Respectfully submitted,

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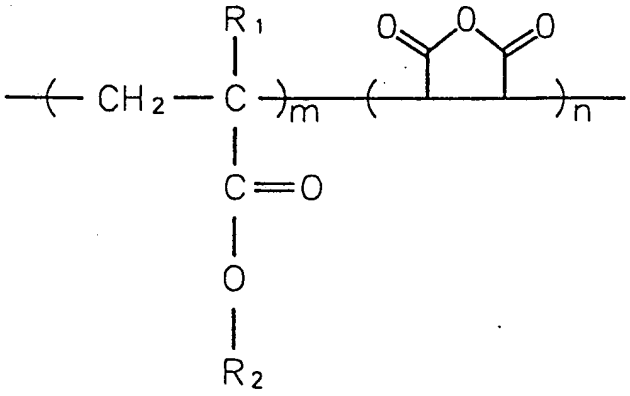
ATTACHMENT "A"

Additions/Deletions to Claims 1 and 5:

1. (Twice amended) A photosensitive copolymer having a weight-average molecular weight of 3,000 to 100,000 and consisting essentially of first and second monomers represented by the following formulae:

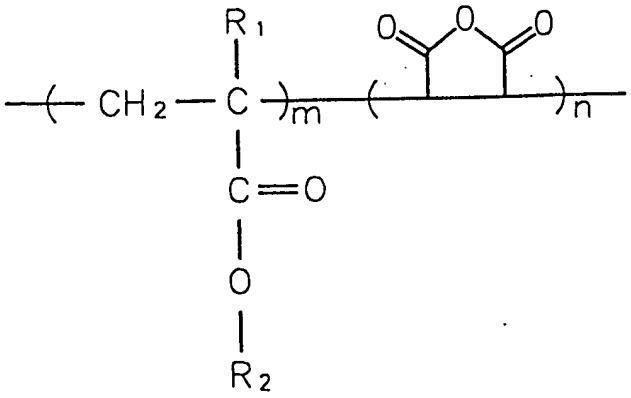


wherein R_1 is a hydrogen atom or methyl, R_2 is an acid-labile tertiary alkyl group, [~~and~~] m/(m+n) is 0.5 to 0.8, and m+n = 1, and

wherein R_2 is 2-methyl-2-norbornyl, 2-ethyl-2-norbornyl, 2-methyl-2-isobornyl, 2-ethyl-2-isobornyl, 8-methyl-8-tricyclo[5.2.1.$0^{2,6}$]decanyl, or 8-ethyl-8-tricyclo[5.2.1.$0^{2,6}$]decanyl.

5. A resist composition comprising:

(a) a photosensitive copolymer having a weight-average molecular weight of 3,000 to 100,000 and consisting essentially of first and second monomers represented by the following formulae:



wherein R_1 is a hydrogen atom or methyl, R_2 is an acid-labile tertiary alkyl group, [~~and~~] m/(m+n) is 0.5 to 0.8, and m+n = 1, and wherein R_2 is 2-methyl-2-norbornyl, 2-ethyl-2-norbornyl, 2-methyl-2-isobornyl, 2-ethyl-2-isobornyl, 8-methyl-8-tricyclo[5.2.1.$0^{2,6}$]decanyl, or 8-ethyl-8-tricyclo[5.2.1.$0^{2,6}$]decanyl; and

(b) a photoacid generator (PAG).